Quick Summary of Grant-Kohrs Ranch NHS GRI meeting August 19, 2002

Summary
A geologic resources inventory workshop was held for Grant-Kohr's Ranch NHS (GRKO) on August 19, 2002 to view and discuss the park's geologic resources, to address the status of geologic mapping for compiling both paper and digital maps, and to assess resource management issues and needs. Cooperators from the NPS Geologic Resources Division (GRD), NPS Grant-Kohr's Ranch NHS, and the Montana Bureau of Mines and Technology were present for the workshop.

This involved a field trip to view the geology of the Grant-Kohr's Ranch NHS area with the Montana Bureau of Mines and Geology and a scoping session to present overviews of the NPS Inventory and Monitoring (I&M) program, the Geologic Resources Division, and the on-going Geologic Resources Inventory (GRI). Round table discussions involving geologic issues for Grant-Kohr's Ranch NHS included interpretation, the status of geologic mapping efforts, sources of available data, and action items generated from this meeting.

Because of the upstream impacts of mining in Butte, Montana, over the last 100 years, heavy metals have impacted the GRKO area negatively. On the field trip, the group was shown a deposit of arsenic that resulted from a large flood event in 1908 in stream banks flowing through the park. Considerable soil had been developed on top of the deposit in the last 94 years. Ben Bobowski is interested in expanding the existing two park quadrangles of interest (Deer Lodge and Conleys Lake) to include more quadrangles that take in the drainage basin of the surrounding area.

For a list of Attendees and their contact information, see the last page of this document.

OVERVIEW OF GEOLOGIC RESOURCES INVENTORY (GRI)

The NPS GRI has the following goals:

1. to assemble a bibliography of associated geological resources for NPS units with significant natural resources ("GRBIB") to compile and evaluate a list of existing geologic maps for each unit,

2. to conduct a scoping session for each park,

3. to develop digital geologic map products, and

4. to complete a geological report that synthesizes much of the existing geologic knowledge about each park.

It is stressed that the emphasis of the inventory is ***not*** to routinely initiate new geologic mapping projects, but to aggregate existing "baseline" information and identify where serious geologic data needs and issues exist in the National Park System. In cases

where map coverage is nearly complete (ex. 4 of 5 quadrangles for Park “X”) or maps simply do not exist, then funding may be available for geologic mapping.

After introductions by the participants, Tim Connors and Bruce Heise (both NPS-GRD) presented overviews of the Geologic Resources Division, the NPS I&M Program, the status of the natural resource inventories, and the GRI in particular.

They also presented a demonstration of some of the main features of the GRI digital geologic database. This has become the prototype for the NPS digital geologic map model as it reproduces all aspects of a paper map (i.e. it incorporates the map notes, cross sections, legend etc.) with the added benefit of being geospatially referenced. It is displayed in ESRI ArcView shape files and features a built-in Microsoft Windows help file system to identify the map units. It can also display scanned JPG or GIF images of the geologic cross sections supplied with the paper "analog" map. Geologic cross section lines (ex. A-A') are subsequently digitized as a line coverage and are hyperlinks to the scanned images.

Tim further demonstrated the developing NPS Theme Manager for adding GIS coverage’s into projects "on-the-fly". With this functional browser, numerous NPS themes can be added to an ArcView project with relative ease. Such themes might include geology, paleontology, hypsography (topographic contours), vegetation, soils, etc.

GRBIB

At the scoping session, individual Microsoft Word Documents of Geologic Bibliographies for GRKO were distributed.

The sources for this compiled information are as follows:

- AGI (American Geological Institute) GeoRef
- USGS GeoIndex
- ProCite information taken from specific park libraries

These bibliographic compilations were validated by GRI staff to eliminate duplicate citations and typographical errors, as well as to check for applicability to the specific park. After validation, they become part of a Microsoft Access database parsed into columns based on park, author, year of publication, title, publisher, publication number, and a miscellaneous column for notes.

From the Access database, they are exported as Microsoft Word Documents for easier readability, and eventually turned into PDF documents. They are then posted to the GRI website at: http://www2.nature.nps.gov/grd/geology/gri/products/geobib/ for general viewing.

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EXISTING GEOLOGIC MAPS

After the bibliographies were assembled, a separate search was made for any existing surficial and bedrock geologic maps for GRKO. The bounding coordinates for each map were noted and entered into a GIS to assemble an index geologic map. Separate coverage's were developed based on scales (*1:24,000, 1:100,000*, etc.) available for the specific park. Numerous geologic maps at varying scales and vintages cover the area. Index maps were distributed to each workshop participant during the scoping session.

Geologic Mapping:

At present, there are a few maps of various scales covering the GRKO area in published form. Currently the Montana Bureau of Mines and Geology are producing a geologic map of the Deer Lodge 15' quadrangle at 1:48,000 scale of the following quadrangles: Deer Lodge (one of two current GRKO quadrangles of interest); Baggs Creek, Orofino Creek, and Sugarloaf Mountain. They showed a draft that is very near completion and is also in ArcInfo format. There is a textual document with ancillary map information and map unit descriptions as well that will accompany this. They intend to publish it as an open file report in mid-2003.

The Conleys Lake quadrangle is not currently mapped at a scale suitable for park management needs and Dick Berg is interested in doing the mapping of the entire quadrangle at 1:24,000 scale. He anticipates that he could begin the work in 2003 upon completion of the Deer Lodge 15' geologic map. They would also deliver this map to the NPS in digital format like the Deer Lodge quadrangle.

The Conley's lake quad is covered on Butte 250k and the 62.5s and 63360s, but data are quite coarse and dated and probably more refined mapping would be desired. However, there is probably good textual information on these maps that might be able to be gleaned for the current project.

Dick Berg is interested in mapping the Conleys Lake 7.5' quad in 2003 if NPS can assist financially or otherwise. MT GS would then open file it. We'll send them our template to them.

Dick Berg suggested mapping the following quadrangles to get better coverage for the drainage basin of the GRKO area: Garrison, Conleys Lake, Deer Lodge, Racetrack, Orofino Creek, Warm Springs, Orofino Mountain, Opportunity, Ramose, Butte North, Elk Park Pass, Buxton, Butte South, Homestake, Tucker Creek

As far as a geologic report for the park, GRI staff may be able to use portions of the Deer Lodge 15' map text and may also consult the 1:250,000 Butte sheet for its ancillary information.

Digital Geologic Map coverage:

The Montana Bureau of Mines has completed digitization of numerous 1:100,000 scale maps within the state of Montana. They are available to view as an index map for

download from http://www.mbmg.mtech.edu. GRI staff needs to call their publication and sales office to get FTP access to the actual digital files. Karen Porter says to call Judy for digital and hardcopy and tell them we're a federal agency and they'll allow us to have them at no charge.

Other desired GIS data:
Soils maps are also of interest to GRKO staff. Tim Connors will check with Pete Biggam (NPS-Soil Scientist) on the status of soils mapping for the area; will require more follow-up.

Miscellaneous:
In a brainstorming session, GRKO staff says the main geologic issues at the park are as follows:

- Ground-water movement;
- surface water movement as affected by surficial deposits and soils and how they relate to contaminant transport from upstream acid mine drainage
- Non-point source run-off and how it's effecting neighbors and the park plant communities.
- Need to Define influences of bedrock and topography on watersheds

To better understand these processes, GRKO has an in-depth environmental quality assessment done in cooperation with several universities. It is entitled "US Department of Interior Site Characterization and Natural Resource Damage Assessment Studies, Grant-Chars Ranch NHS and Bureau of Land Management, 2000-2001; Clark Fork River Operable Unit of the Milltown Reservoir Sediments NPL Site; July 8, 2002"

Dan Nottingham distributed CD-ROM copies of the above to a few of the meeting attendants, including GRI staff.

Ben Bobowsky is interested in water rights in the area and needs NPS-WRD's Horizon reports. Folks to contact in Fort Collins are either Dan Kimball or Dean Tucker, who should be able to assist with both groundwater and surficial water issues.

Ed Deal says the Montana Bureau of Mines and Geology is producing Ground-water assessments for the area that should be of great benefit to GRKO as well. It was also mentioned that Tom Patton has a database on water issues for the area at the Montana Bureau of Mines and Geology.

GRKO GIS support has come from Theresa Ely's shop in the Intermountain Region GIS Support Office, but Ben Bobowsky said he is looking to hire a full-time GIS position into GRKO in the very near future.

List of Attendees
Grant-Kohrs Ranch NHS GRI meeting
August 19, 2002

LAST NAME	FIRST NAME	Aff.	AFFILIATION	TITLE	PHONE	Field Trip	Scoping Session	E-MAIL
Berg	Dick	state	Montana Bureau of Mines and Geology	geologist		yes	yes	dberg@mtech.edu
Bobowski	Ben	federal	NPS-GRKO	Chief Ranger	406-846-2070	yes	yes	Ben_Bobowski@nps.gov
Connors	Tim	federal	NPS, Geologic Resources Division	geologist	(303) 969-2093	yes	yes	Tim_Connors@nps.gov
Deal	Ed	state	Montana Bureau of Mines and Geology	geologist		yes	yes	edeal@mtech.edu
Heise	Bruce	federal	NPS, Geologic Resources Division	geologist	(303) 969-2017	yes	yes	Bruce_Heise@nps.gov
Nottingham	Greg	federal	NPS-GRKO		406-846-2070, ext. 29	yes	yes	greg_nottingham@nps.gov
Porter	Karen	state	Montana Bureau of Mines and Geology	geologist	406-496-4327	yes	yes	kporter@mtech.edu